

## CUNY Common Core Course Submission Form

Instructions: All courses submitted for the Common Core must be liberal arts courses. Courses may be submitted for only one area of the Common Core. All courses must be 3 credits/3 hours unless the college is seeking a waiver for a 4-credit Math or Science course (after having secured approval for sufficient 3-credit/3-hour Math and Science courses). All standard governance procedures for course approval remain in place.

<b>College</b>	Kingsborough Community College
<b>Course Number</b>	Bio 12
<b>Course Title</b>	Human Anatomy and Physiology 2
<b>Department(s)</b>	Biological Sciences
<b>Discipline</b>	Human Anatomy and Physiology
<b>Subject Area</b>	<i>Life and Physical Sciences</i>
<b>Credits</b>	4
<b>Contact Hours</b>	7
<b>Pre-requisites</b>	Placement at the college level fro English and math.
<b>Catalogue Description</b>	A one-year, two-semester course in human anatomy and physiology. Examines complementary relationships between structure and function; dynamic aspects, integration of organs and organ systems in the maintenance of normal functioning of the whole organism. Dissections and other laboratory experiences including computer-assisted study of physiological principles.
<b>Syllabus</b>	See pages 6-10 of this document.

### Waivers for 4-credit Math and Science Courses

All Common Core courses must be 3 credits and 3 hours.

Waivers for 4-credit courses will only be accepted in the required areas of Mathematical and Quantitative Reasoning and Life and Physical Sciences. Such waivers will only be approved after a sufficient number of 3-credit/3-hour math and science courses are approved for these areas.

<b>If you would like to request a waiver please check here:</b>	<input checked="" type="checkbox"/> Waiver requested
<b>If waiver requested:</b> Please provide a brief explanation for why the course will be 4 credits.	This course is a pre-requisite for allied health majors. The content of this course dictates that it be taught as a 4 credit course with a 4 hour lab.
<b>If waiver requested:</b> Please indicate whether this course will satisfy a major requirement, and if so, which major requirement(s) the course will fulfill.	This course satisfies the major requirements for Biology majors with the following transfer options: Occupational Therapy, Pharmacy, Physician's Assistant; it is also a degree requirement for students enrolled in the Physical Therapy Assistant Program. In addition, this course satisfies major requirements for Exercise Science Majors in the Dept. of health, Phys Ed and Recreation.

Indicate the status of this course being nominated:

☒ current course   ☐ revision of current course   ☐ a new course being proposed

### CUNY COMMON CORE Location

Please check below the area of the Common Core for which the course is being submitted. (Select only one.)

#### Required

- ☐ English Composition  
☐ Mathematical and Quantitative Reasoning  
☒ Life and Physical Sciences

#### Flexible

- ☐ World Cultures and Global Issues   ☐ Individual and Society  
☐ US Experience in its Diversity   ☐ Scientific World  
☐ Creative Expression

### Learning Outcomes

In the left column explain the assignments and course attributes that will address the learning outcomes in the right column.

#### I. Required Core (12 credits)

##### A. English Composition: Six credits

A course in this area must meet all the learning outcomes in the right column. A student will:

- Read and listen critically and analytically, including identifying an argument's major assumptions and assertions and evaluating its supporting evidence.
- Write clearly and coherently in varied, academic formats (such as formal essays, research papers, and reports) using standard English and appropriate technology to critique and improve one's own and others' texts.
- Demonstrate research skills using appropriate technology, including gathering, evaluating, and synthesizing primary and secondary sources.
- Support a thesis with well-reasoned arguments, and communicate persuasively across a variety of contexts, purposes, audiences, and media.
- Formulate original ideas and relate them to the ideas of others by employing the conventions of ethical attribution and citation.

##### B. Mathematical and Quantitative Reasoning: Three credits

A course in this area must meet all the learning outcomes in the right column. A student will:

- Interpret and draw appropriate inferences from quantitative representations, such as formulas, graphs, or tables.
- Use algebraic, numerical, graphical, or statistical methods to draw accurate conclusions and solve mathematical problems.
- Represent quantitative problems expressed in natural language in a suitable mathematical format.
- Effectively communicate quantitative analysis or solutions to mathematical problems in written or oral form.
- Evaluate solutions to problems for reasonableness using a variety of means, including informed estimation.
- Apply mathematical methods to problems in other fields of study.

<b>C. Life and Physical Sciences: Three credits</b>  A course in this area <u>must meet all the learning outcomes</u> in the right column. A student will:	
Students will participate in weekly laboratory exercises that require standard laboratory techniques including dissections and experimentation.	<ul style="list-style-type: none"> <li>Identify and apply the fundamental concepts and methods of a life or physical science.</li> </ul>
Students complete weekly laboratory assignments designed to utilize the scientific method, including investigations of the structure and function of various body systems.	<ul style="list-style-type: none"> <li>Apply the scientific method to explore natural phenomena, including hypothesis development, observation, experimentation, measurement, data analysis, and data presentation.</li> </ul>
Students utilize a variety of laboratory equipment including, but not limited to microscopy.	<ul style="list-style-type: none"> <li>Use the tools of a scientific discipline to carry out collaborative laboratory investigations.</li> </ul>
Students conduct weekly laboratory experiments that require data collection, analysis and reporting.	<ul style="list-style-type: none"> <li>Gather, analyze, and interpret data and present it in an effective written laboratory or fieldwork report.</li> </ul>
Students are required to write a research paper based on current peer-reviewed journal articles.	<ul style="list-style-type: none"> <li>Identify and apply research ethics and unbiased assessment in gathering and reporting scientific data.</li> </ul>
<b>II. Flexible Core (18 credits)</b> Six three-credit liberal arts and sciences courses, with at least one course from each of the following five areas and no more than two courses in any discipline or interdisciplinary field.	
<b>A. World Cultures and Global Issues</b>  A Flexible Core course <u>must meet the three learning outcomes</u> in the right column.	
	<ul style="list-style-type: none"> <li>Gather, interpret, and assess information from a variety of sources and points of view.</li> </ul>
	<ul style="list-style-type: none"> <li>Evaluate evidence and arguments critically or analytically.</li> </ul>
	<ul style="list-style-type: none"> <li>Produce well-reasoned written or oral arguments using evidence to support conclusions.</li> </ul>
A course in this area (II.A) <u>must meet at least three of the additional learning outcomes</u> in the right column. A student will:	
	<ul style="list-style-type: none"> <li>Identify and apply the fundamental concepts and methods of a discipline or interdisciplinary field exploring world cultures or global issues, including, but not limited to, anthropology, communications, cultural studies, economics, ethnic studies, foreign languages (building upon previous language acquisition), geography, history, political science, sociology, and world literature.</li> </ul>
	<ul style="list-style-type: none"> <li>Analyze culture, globalization, or global cultural diversity, and describe an event or process from more than one point of view.</li> </ul>
	<ul style="list-style-type: none"> <li>Analyze the historical development of one or more non-U.S. societies.</li> </ul>
	<ul style="list-style-type: none"> <li>Analyze the significance of one or more major movements that have shaped the world's societies.</li> </ul>
	<ul style="list-style-type: none"> <li>Analyze and discuss the role that race, ethnicity, class, gender, language, sexual orientation, belief, or other forms of social differentiation play in world cultures or societies.</li> </ul>
	<ul style="list-style-type: none"> <li>Speak, read, and write a language other than English, and use that language to respond to cultures other than one's own.</li> </ul>

<b>B. U.S. Experience in its Diversity</b>  A Flexible Core course <u>must meet the three learning outcomes</u> in the right column.
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	<ul style="list-style-type: none"> <li>• Gather, interpret, and assess information from a variety of sources and points of view.</li> </ul>
	<ul style="list-style-type: none"> <li>• Evaluate evidence and arguments critically or analytically.</li> </ul>
	<ul style="list-style-type: none"> <li>• Produce well-reasoned written or oral arguments using evidence to support conclusions.</li> </ul>

A course in this area (II.B) must meet at least three of the additional learning outcomes in the right column. A student will:

	<ul style="list-style-type: none"> <li>• Identify and apply the fundamental concepts and methods of a discipline or interdisciplinary field exploring the U.S. experience in its diversity, including, but not limited to, anthropology, communications, cultural studies, economics, history, political science, psychology, public affairs, sociology, and U.S. literature.</li> </ul>
	<ul style="list-style-type: none"> <li>• Analyze and explain one or more major themes of U.S. history from more than one informed perspective.</li> </ul>
	<ul style="list-style-type: none"> <li>• Evaluate how indigenous populations, slavery, or immigration have shaped the development of the United States.</li> </ul>
	<ul style="list-style-type: none"> <li>• Explain and evaluate the role of the United States in international relations.</li> </ul>
	<ul style="list-style-type: none"> <li>• Identify and differentiate among the legislative, judicial, and executive branches of government and analyze their influence on the development of U.S. democracy.</li> </ul>
	<ul style="list-style-type: none"> <li>• Analyze and discuss common institutions or patterns of life in contemporary U.S. society and how they influence, or are influenced by, race, ethnicity, class, gender, sexual orientation, belief, or other forms of social differentiation.</li> </ul>

### C. Creative Expression

A Flexible Core course must meet the three learning outcomes in the right column.

	<ul style="list-style-type: none"> <li>• Gather, interpret, and assess information from a variety of sources and points of view.</li> </ul>
	<ul style="list-style-type: none"> <li>• Evaluate evidence and arguments critically or analytically.</li> </ul>
	<ul style="list-style-type: none"> <li>• Produce well-reasoned written or oral arguments using evidence to support conclusions.</li> </ul>

A course in this area (II.C) must meet at least three of the additional learning outcomes in the right column. A student will:

	<ul style="list-style-type: none"> <li>• Identify and apply the fundamental concepts and methods of a discipline or interdisciplinary field exploring creative expression, including, but not limited to, arts, communications, creative writing, media arts, music, and theater.</li> </ul>
	<ul style="list-style-type: none"> <li>• Analyze how arts from diverse cultures of the past serve as a foundation for those of the present, and describe the significance of works of art in the societies that created them.</li> </ul>
	<ul style="list-style-type: none"> <li>• Articulate how meaning is created in the arts or communications and how experience is interpreted and conveyed.</li> </ul>
	<ul style="list-style-type: none"> <li>• Demonstrate knowledge of the skills involved in the creative process.</li> </ul>
	<ul style="list-style-type: none"> <li>• Use appropriate technologies to conduct research and to communicate.</li> </ul>

### D. Individual and Society

A Flexible Core course must meet the three learning outcomes in the right column.

	<ul style="list-style-type: none"> <li>• Gather, interpret, and assess information from a variety of sources and points of view.</li> </ul>
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	<ul style="list-style-type: none"> <li>Evaluate evidence and arguments critically or analytically.</li> </ul>
	<ul style="list-style-type: none"> <li>Produce well-reasoned written or oral arguments using evidence to support conclusions.</li> </ul>
A course in this area (II.D) <u>must meet at least three of the additional learning outcomes</u> in the right column. A student will:	
	<ul style="list-style-type: none"> <li>Identify and apply the fundamental concepts and methods of a discipline or interdisciplinary field exploring the relationship between the individual and society, including, but not limited to, anthropology, communications, cultural studies, history, journalism, philosophy, political science, psychology, public affairs, religion, and sociology.</li> </ul>
	<ul style="list-style-type: none"> <li>Examine how an individual's place in society affects experiences, values, or choices.</li> </ul>
	<ul style="list-style-type: none"> <li>Articulate and assess ethical views and their underlying premises.</li> </ul>
	<ul style="list-style-type: none"> <li>Articulate ethical uses of data and other information resources to respond to problems and questions.</li> </ul>
	<ul style="list-style-type: none"> <li>Identify and engage with local, national, or global trends or ideologies, and analyze their impact on individual or collective decision-making.</li> </ul>
<b>E. Scientific World</b> A Flexible Core course <u>must meet the three learning outcomes</u> in the right column.	
	<ul style="list-style-type: none"> <li>Gather, interpret, and assess information from a variety of sources and points of view.</li> </ul>
	<ul style="list-style-type: none"> <li>Evaluate evidence and arguments critically or analytically.</li> </ul>
	<ul style="list-style-type: none"> <li>Produce well-reasoned written or oral arguments using evidence to support conclusions.</li> </ul>
A course in this area (II.E) <u>must meet at least three of the additional learning outcomes</u> in the right column. A student will:	
	<ul style="list-style-type: none"> <li>Identify and apply the fundamental concepts and methods of a discipline or interdisciplinary field exploring the scientific world, including, but not limited to: computer science, history of science, life and physical sciences, linguistics, logic, mathematics, psychology, statistics, and technology-related studies.</li> </ul>
	<ul style="list-style-type: none"> <li>Demonstrate how tools of science, mathematics, technology, or formal analysis can be used to analyze problems and develop solutions.</li> </ul>
	<ul style="list-style-type: none"> <li>Articulate and evaluate the empirical evidence supporting a scientific or formal theory.</li> </ul>
	<ul style="list-style-type: none"> <li>Articulate and evaluate the impact of technologies and scientific discoveries on the contemporary world, such as issues of personal privacy, security, or ethical responsibilities.</li> </ul>
	<ul style="list-style-type: none"> <li>Understand the scientific principles underlying matters of policy or public concern in which science plays a role.</li> </ul>

<p><b>BIOLOGY 12: Human Anatomy and Physiology Spring 2012</b></p> <p><b>SYLLABUS AND COURSE INFORMATION PACKET</b></p>
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**COURSE CO-COORDINATORS FOR BIOLOGY 11 & 12**

Dr. Mary Dawson S207 Ext. 5740 and Dr. Mohamed Lakrim S221 Ext. 5107

**Required Textbook and Laboratory Manual:**

1. Saladin, K.S: Anatomy and Physiology (5<sup>th</sup> ed.). New York: McGraw Hill Co. Inc., 2009.
2. Nicpon-Marieb, Elaine, Human Anatomy and Physiology: Laboratory Manual (Pig version, Tenth edition), Custom Version, Benjamin. Cummings Publishing. Company, Redwood City, California 2009.

**Course Prerequisites**

*Students must meet the following prerequisites: **Successful completion of Biology 11***

**Course Description**

Biology 12 is the second semester of a one-year course in Human Anatomy and Physiology. Both Biology 11 and Biology 12 are designed to provide students with a thorough understanding of the basic principles inherent in the study of human anatomy and physiology, and is intended for students majoring in the allied-health professions, e.g. nursing, pre-physical therapy, pre-physician, assistant, etc. The emphasis of this course will be concerned with understanding the structural and functional relationships of the major organ systems of the human body. A special effort will be made to understand the concept of homeostasis and how the individual organ systems of the body interact with each other in the maintenance of the normal functioning of the entire organism.

Biology 12 combines both lecture and laboratory experiences over a twelve week period. Each week, the class meets for a two-hour lecture session, a one-hour recitation and a three-hour laboratory session. Attendance at these sessions is mandatory, and absences will not be permitted.

There will be two writing assignments during the semester, based on a journal, or some other scientific reference suggested, and approved by your instructor. A typed one-page summary must be submitted for each of the readings. The topic for **each** of the readings is to correspond to a topic in any two of the course units. **Your instructor may substitute alternative writing assignments.**

The assignments are to be submitted type written, double-spaced on 8 1/2 x 11 typing paper, and must include a complete bibliographic reference to the source of the original article from which the abstract was prepared. **A Xerox copy of the original article must be submitted with your summary.** The grades for these assignments will be incorporated into your laboratory grade for the semester. Your instructor will provide additional information concerning this assignment.

**Statement to the Students**

Plagiarism is the intentional use of another's intellectual creations without attribution (giving credit to the author). This is theft of materials from another author, and is prohibited. Determination and penalty-ranging from grade reduction to course failure - is at the discretion of individual faculty members.

## **PROGRAM GOALS FOR STUDENT OUTCOMES**

### **Allied Health Programs**

1. Demonstrate knowledge of basic concepts in anatomy and physiology.
2. Demonstrate proficiency in use of basic laboratory equipment and instruments.
3. Apply knowledge to distinguish normal from homeostatic imbalances.
4. Demonstrate basic computer skills and competence utilizing the Internet for solving problems.
5. Solve a biomedical problem through analysis and interpretation of tabulated and graphical data.
6. Demonstrate understanding of the scientific literature related to allied health fields through presentation of findings in written form and to an audience.

### **COURSE GOALS**

1. Demonstrate understanding of the scientific literature related to allied health fields through presentation of findings in written form and to an audience.
2. Solve a biomedical problem using biomedical knowledge, logic and reasoning skills.
3. Collect data and make sense of it through charts and graphs.
4. Carry out basic quantitative manipulations of biomedical data.
5. Analyze and interpret tabulated and graphical data.
6. Demonstrate knowledge of basic biomedical concepts.
7. Demonstrate proficiency in use of basic laboratory instruments.
8. Demonstrate basic computer skills and competence in use of the Internet.
9. Use knowledge and laboratory skills to recognize normal and disease states.
10. Develop and master the knowledge and biomedical skills to achieve career goals including acquisition of advanced training.

### **Required materials**

Required materials include textbook, laboratory manual, lab coat, gloves, goggles and dissecting instruments. Students will not be allowed in the lab without lab coat. Open toed shoes are not permitted in lab. Disposable Non-Latex Gloves: required for all laboratories using certain hazardous materials (materials that contain body fluids or secretions)

### **Textbook for Biology 11 and Biology 12 and**

### **Laboratory Manual for Biology 11 and 12 (see above references)**

**Recommended:** Rust, Thomas G: A Guide to Anatomy & Physiology Lab. (2nd ed.). Boerne, Texas: Southwest Educational Enterprises, 1986.

Useful Aid: Van De Graaff, Kent M. and John L. Craley: A Photographic Atlas for the Anatomy and Physiology Laboratory (5<sup>th</sup> ed.). Englewood, Colorado: Morton Publishing Company, 2003.

## Learning Objectives

You will note that each of the chapters in your textbook and the laboratory exercises in your laboratory manual begins with a list of clearly defined objectives. These objectives are not questions, rather they identify the goals that should be achieved if you have carefully read and understood the assigned readings. It is strongly suggested that you read the list of objectives prior to each assignment and then again after you have completed your readings. If you have successfully mastered the goals represented by these objectives, you can be assured that you have been successful in your readings.

At the end of this packet you will also find lists of learning objectives that refer to goals that should be mastered for each of the basic units. These objectives should serve as a guide and are not to be considered representative of all of the information that you will be required to master. One way to help insure success on the unit examinations as well as other tests that you will be taking is to be sure that you have mastered the goals listed in these objectives.

## Reading Assignments:

To obtain the maximum advantage from the required readings, you should complete the readings **before** coming to class for the week in which the assignments are given. The lecture syllabus lists the reading assignments that will prepare you for the lectures and laboratory exercises for that particular week and refers to reading assignments in your textbook. The sequence of laboratory exercises lists reading assignments in the laboratory manual. It is very important for you to be familiar with the laboratory exercises before performing the experiments or procedures described in the manual. The benefits that you will derive by completing the readings for lecture and laboratory **prior** to the week for which they are assigned are as follows:

1. You will find that it is easier to understand the lecture and laboratory material because you already have some background regarding the topics that are to be covered.
2. The reading assignments for lecture and laboratory are directly related to the topics that will be covered. If you are already familiar with these topics, you will find that you will be able to take fewer and better notes and pay more attention to what the lecturer is saying.
3. Prior reading of the assignments can help you to pinpoint areas which may be giving you some difficulty. You then can pay very special attention to what the lecturer is saying when discussing these same topics.
4. Reading the assigned material for the laboratory in both the textbook and laboratory manual **prior** to coming to laboratory will help you to get most from your laboratory experiences. Having relevant background information will significantly help you to better understand the laboratory exercises.

## Grade Determination:

1. **Laboratory:** The laboratory portion of Biology 12 represents 50% of the course grade. The grade for laboratory will be based on your quiz grades, the writing assignments, and other factors that will be explained to you by your laboratory instructor.
2. **Lecture:** There will be three unit exams that will be administered during the semester (consult the syllabus as to the exact weeks). Each of the unit examinations will represent 10% of your grade. The final examination will account for 20% of your grade.

### 3. Summary of the grading procedures

Laboratory quizzes, summaries, class participation etc.	= 50%
First unit examination	= 10%
Second unit examination	= 10%
Third unit examination	= 10%
Final examination	= 20%
<b>Total</b>	<b>= 100%</b>



# Lecture outline (Textbook)

## Week #

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- 1 **Intro Introduction to Course, Course Organization. Digestive system.** Organization and function. Physiology of chemical digestion and absorption. **Lecture Reading Assignment:** chapter 25
- 2 **The Cardiovascular System.** Introduction to the Cardiovascular System. Brief overview of function and organization of the cardiovascular system. Properties of Blood. **Lecture Reading Assignment:** chapter 18
- 3 **The Cardiovascular System.** Cardiovascular Physiology: Structure, function, location of the heart. 2. Cardiac physiology a. properties of heart muscle b. conduction system of the heart c. cardiac cycle d. heart sounds e. regulation of cardiac cycle f. cardiac output. **Lecture Reading Assignment:** chapter 19
- 4 **The Cardiovascular System:** Blood Vessel Organization. Blood Pressure: factors affecting blood pressure, control over blood pressure. **Lecture Reading Assignments:** chapter 20
- 5 **The Lymphatic System.** Lymphatic pathways and vessels. Composition and movement of lymphatic fluid. Lymphatic organs.. **Lecture Reading Assignments:** chapter 21 **The Immune System: Innate and Adaptive Body Defense. Lecture Reading Assignments:** chapter 21
- 6 **The Respiratory System.** Mechanisms of Breathing. Gas Exchange. Transport of Gases. Control of Breathing. **Lecture reading assignment:** chapter 22
- 7 **The Urinary System.** Urine Formation (physiological principles controlling renal activities). Control of Urinary Output. **Lecture reading assignment:** chapter 23
- 8 **Fluids and Electrolytes.** Distribution of Body Fluids. Water Balance. Electrolyte Balance. **Lecture reading assignment:** chapter 24, pp. 942-953
- 9 **The Acid Base Balance.** Review acid, bases, and pH. Role of buffer systems in the body. Role of the respiratory and urinary systems in maintaining a constant pH. **Lecture Reading Assignment:** chapter 24, pp. 954-964
- 10 **The Reproductive System.** Male Reproductive Physiology: Hormonal control of male reproductive functions. **Lecture Reading Assignment:** chapter 27, pp. 1047-1076. Female Reproductive Physiology: Hormonal control of the female reproductive cycle. **Lecture Reading Assignment:** chapter 28, pp. 1077-1098
- 11 **Human Development.** Early Embryonic Development. Adjustment of the infant to extrauterine life. **Lecture Reading Assignment:** chapter 29 pp. 1117-1133
- 12 **Pregnancy.** Pregnancy (hormonal changes associated with pregnancy, labor, the birth process, and parturition, mammary glands. Breast development and lactation. **Lecture Reading Assignment:** chapter 28, pp. 1099-1115

# Laboratory Exercises

## Week #

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- 1 **Digestive system 38.** Introduction and lab safety. Organ system overview Using models. Gross anatomy of digestive system. Using prepared dissected pig (instructor demo). Microscopic anatomy. Chemical digestion: **39A. Activity 3 p. 601**
- 2 **Digestive system. Diss. ex. 6 p. 741.** Student dissection and identification of pig digestive system.  
**Circulatory System part I: Properties of blood 29A.** formed elements-Wright's stain, hematocrit, hemoglobin-Tallquist method, coagulation time
- 3 **Circulatory System II: Heart and Vessels 30.** Anatomy of the Heart (organization, gross anatomy, dissection of sheep heart, Organization of blood vessels-histology **32 Act 1 p. 472**
- 4 **Circulatory System III: Circulatory Pathways.** 1. Gross Anatomical Organization: **32. Circulatory pathways..** Pig dissection **Diss. ex. 4, p. 727**
- 5 **Cardiovascular Physiology.** Conduction system of the heart **31 Act 1B Biopac – Electrocardiography.** Cardiac Cycle and Heart Sounds **33A.** Marieb Interactive Physiology computer exercise
- 6 **Lymphatics and Immunity 29A, Act 7 p. 434.** Blood typing. Review. Organ identification. Histology **35A, Act. 1 and 2.** Dissection: Pig lymphatic system **Diss. Ex. 4 p. 727**
- 7 **The Respiratory System.** Organization, gross and microscopic anatomy, **36.** Pig dissection: respiratory system. **Diss. Ex. 5 p. 737.** Mechanics of breathing, respiratory **37A Act. 5 Biopac p. 560.** volumes, respiratory sounds.. Biopac computer exercise.
- 8 **The Urinary System 40.** Organization, gross and microscopic anatomy. Diffusion and osmosis review. Dissection; Sheep kidney. Dissection: Pig urinary system **Diss. ex. 7 p.**
- 9 **Urinalysis 41A.** Composition of urine. Analysis of components of normal and abnormal urine. **Acids, Bases and Buffers 37A (act. 7-9)**
- 10 **Reproduction Part I. 42.** Organization, gross and microscopic anatomy of male and female reproductive systems. Pig dissection **Diss. ex. 8 p. 751**
- 11 **Reproduction Part II.** Mitosis **4 pp. 45-48.** 2. Meiosis, gametogenesis. **43.** Ovarian cycle. principles of heredity **45**
- 12 **Embryonic Development Part I. 44.** Sea Urchin embryology. Chick embryology (extra embryonic membranes, early stages of development, Human development. early stages of human development. Placenta.